Scatter graphs and correlation

ANSWERS

1

The number of people at eight barbecues and the number of burgers eaten.

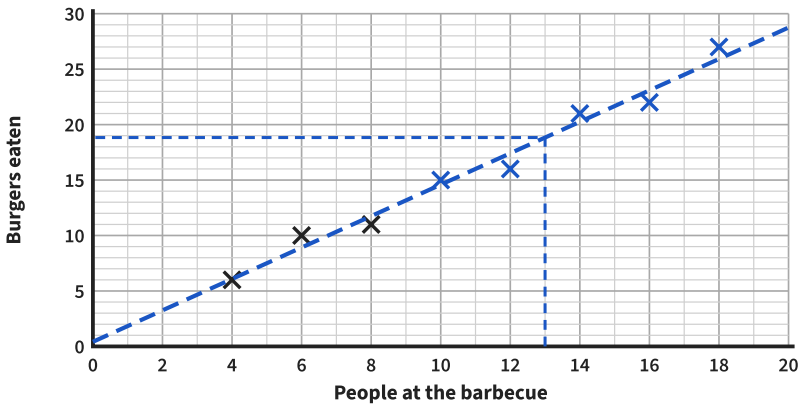
People	4	6	8	10	12	14	16	18
Burgers	6	10	11	15	16	21	22	27

(a) Plot the points as crosses.
(b) Describe the correlation. (c) Draw a line of best fit. Go up from 13 to the line, then across, to estimate the burgers eaten by 13 people.

(b) _____ **correlation** positive

In words: the more people, the more burgers

(c) about 19 (accept 16 to 22)



2

The lengths and masses of eight hedgehogs at a rescue centre.

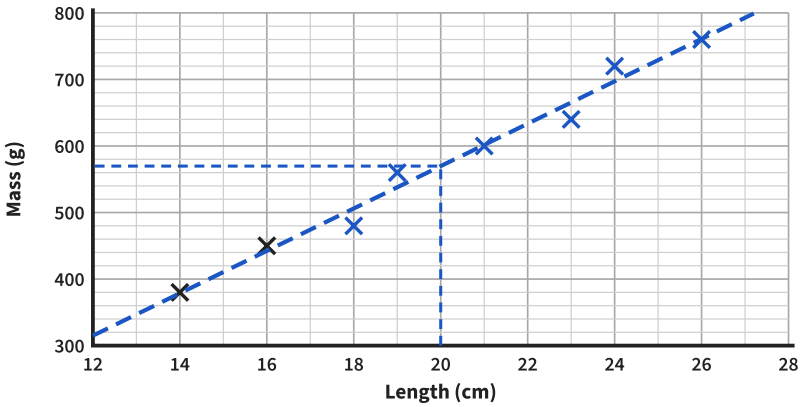
Length (cm)	14	16	18	19	21	23	24	26
Mass (g)	380	450	480	560	600	640	720	760

(a) Plot the points. (b) Describe the correlation in words. (c) Draw a line of best fit and estimate the mass of a hedgehog 20 cm long.

(b) _____ **correlation** positive

In words: the longer, the heavier

(c) about 570 g (accept 530 to 610)



3

The height above sea level of eight mountain villages and the temperature at noon on one day.

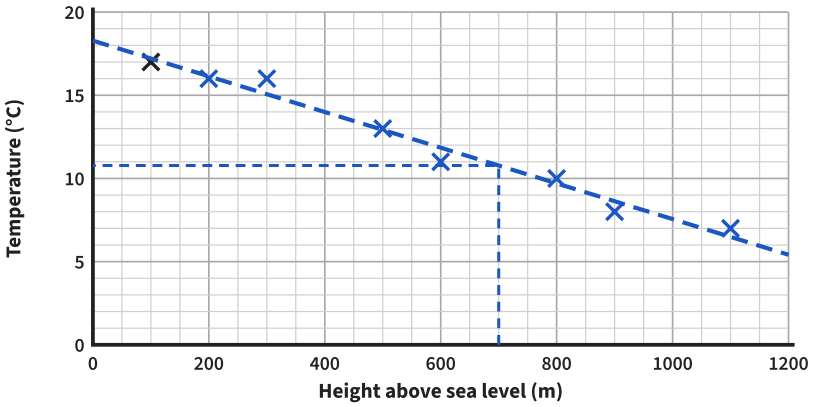
Height (m)	100	200	300	500	600	800	900	1100
Temp (°C)	17	16	16	13	11	10	8	7

(a) Plot the points. (b) Describe the correlation in words. (c) Draw a line of best fit and estimate the temperature in a village 700 m high.

(b) negative correlation

In words: the higher, the colder

(c) about 11 °C (accept 9 to 13)



4 Notice the change!

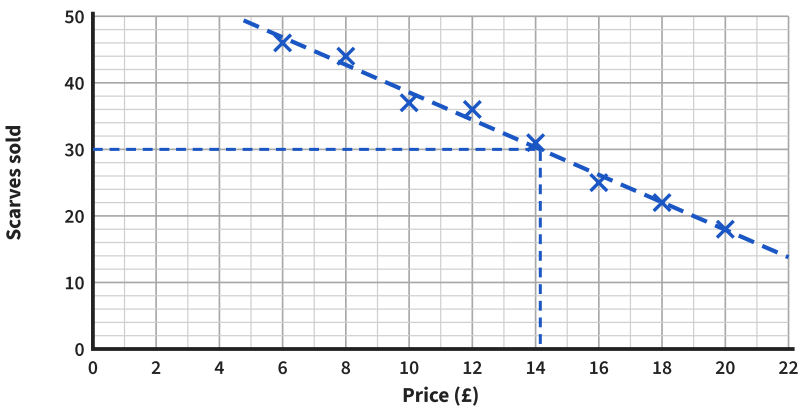
The price of a scarf in eight shops and the number of scarves each shop sold in a week.

Price (£)	6	8	10	12	14	16	18	20
Sold	46	44	37	36	31	25	22	18

(a) Plot the points. (b) Describe the correlation.
(c) Draw a line of best fit. A shop sold 30 scarves. Go across from 30 to the line, then down, to estimate its price.

(b) negative correlation

(c) about £14 (accept £13 to £15)



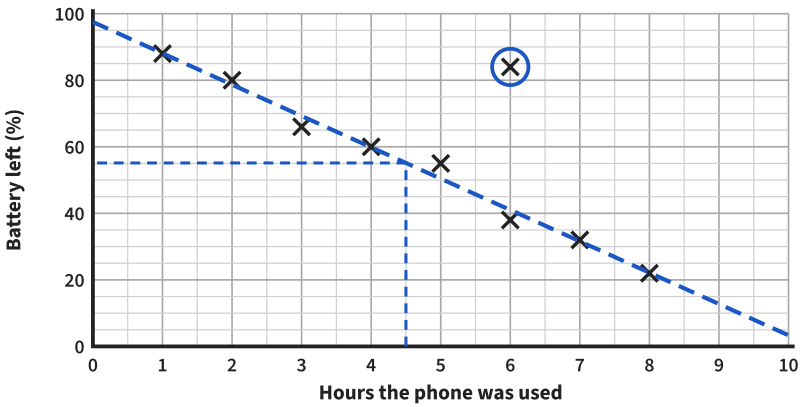
Scatter graphs and correlation

ANSWERS

5

The scatter graph shows how many hours nine phones were used in a day and the battery left at bedtime.

(a) Circle the outlier. (b) Describe the correlation in words. (c) Leave the outlier out. Draw a line of best fit and estimate the battery left after 4.5 hours.



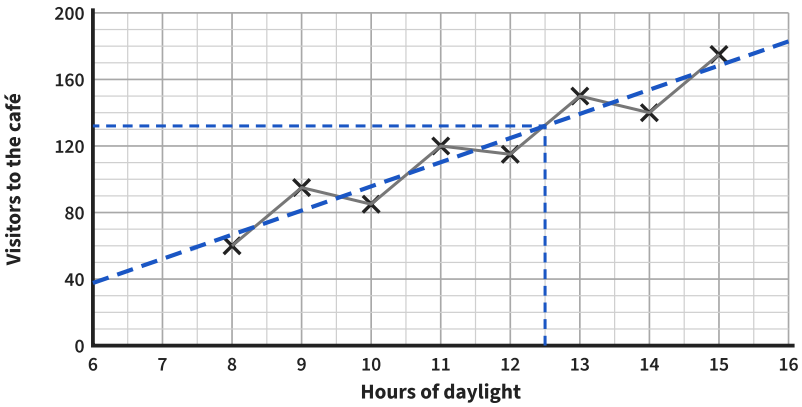
(b) the more hours, the less battery

(c) about 55% (accept 51% to 59%)

6

Ivy plotted the hours of daylight on eight days and the visitors to a park café. Then she joined the dots.

(a) What has Ivy done wrong? (b) Draw a line of best fit. Use it to estimate the visitors on a day with 12.5 hours of daylight.



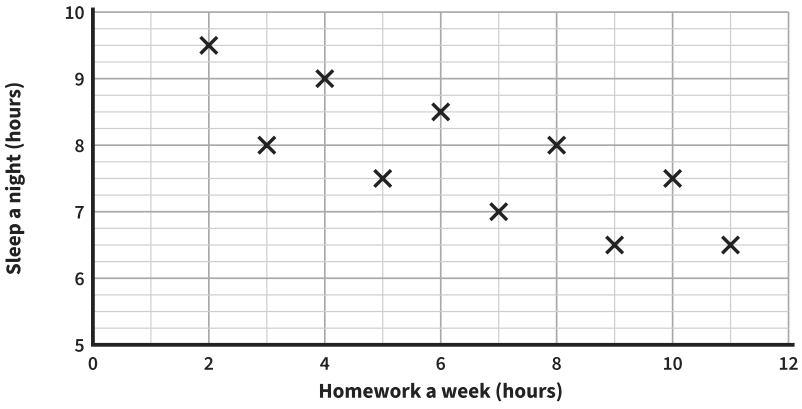
(a) don't join the dots: draw one straight line

(b) about 132 (accept 122 to 142)

7

The scatter graph shows the hours of homework ten students did in a week and how long they slept each night.

(a) Is the correlation strong or weak? Is it positive or negative? (b) Describe the correlation in words.



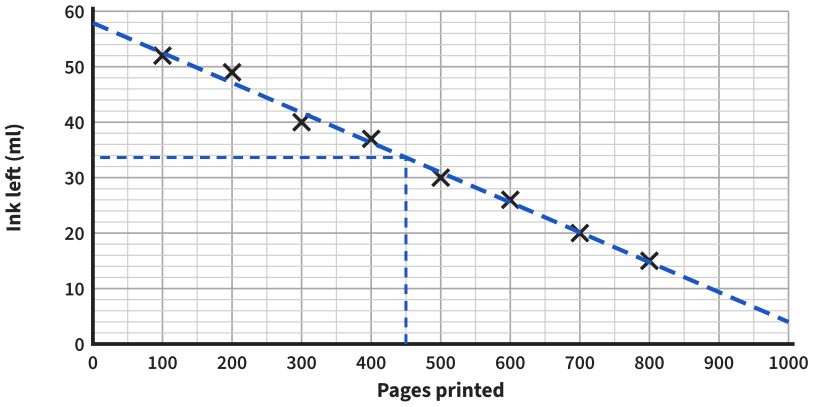
(a) weak negative correlation

(b) more homework, a little less sleep

8

The scatter graph shows the ink left in a printer after printing different numbers of pages.

(a) Draw a line of best fit and estimate the ink left after 450 pages. (b) Explain why an estimate for 2000 pages would not be reliable.



(a) about 34 ml (accept 32 to 36)

(b) 2000 is far outside the data

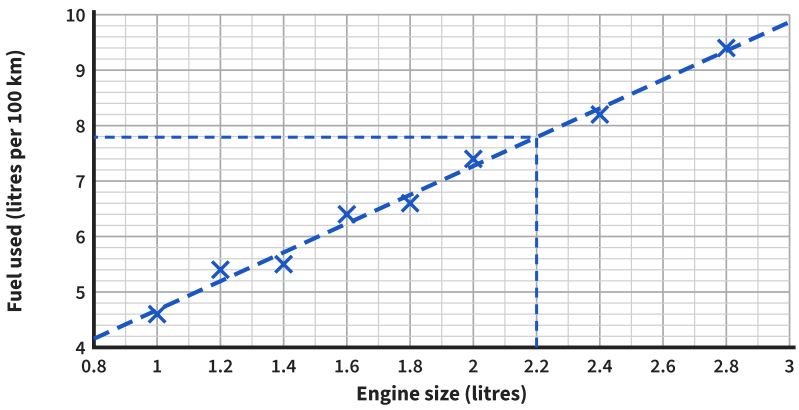
Scatter graphs and correlation *further practice* ANSWERS

9

Eight cars: the size of each engine and the fuel it uses to drive 100 km.

Engine (litres)	1	1.2	1.4	1.6	1.8	2	2.4	2.8
Fuel	4.6	5.4	5.5	6.4	6.6	7.4	8.2	9.4

(a) Plot the points. (b) Describe the correlation in words. (c) Estimate the fuel used by a car with a 2.2 litre engine.



(b) *bigger engine, more fuel*

(c) *about 7.8 litres (accept 7.4 to 8.2)*

10

Here are three scatter graphs.

Describe the correlation each graph shows. Say if it is strong or weak.



A *weak negative*

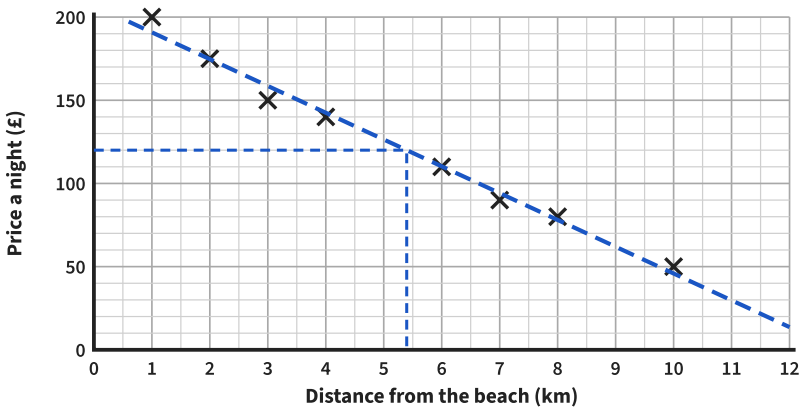
B *strong positive*

C *no correlation*

11

The scatter graph shows the distance of eight holiday cottages from a beach and the price of a night in each.

Kim can spend £120 a night. Use a line of best fit to estimate how close to the beach she can stay.



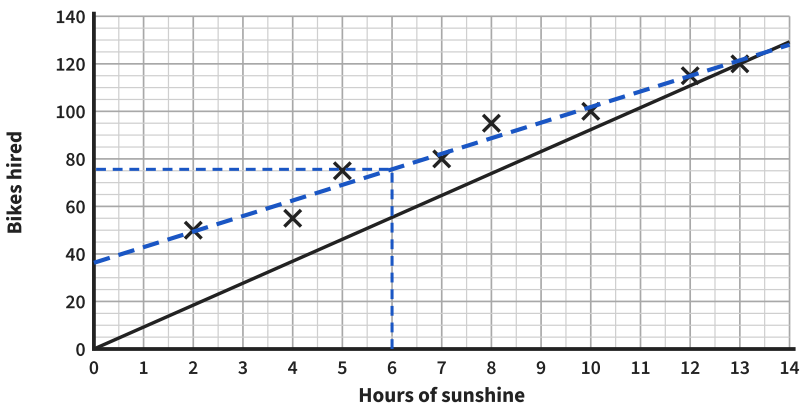
Answer *about 5.4 km (accept 4.9 to 5.9)*

away from the beach, or further

12

Rhys drew this line of best fit for the hours of sunshine and the bikes hired from a seafront stand on eight days. He made it go through (0, 0).

(a) Why is it not a good line of best fit? (b) Draw a better one and estimate the bikes hired on a day with 6 hours of sunshine.



(a) *nearly every point is above it*

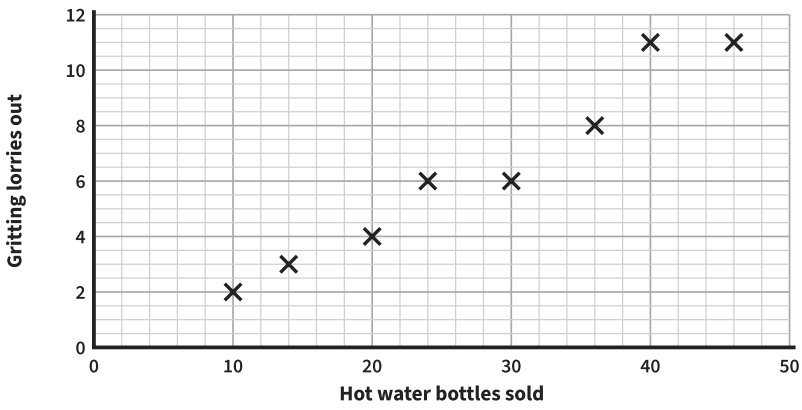
(b) *about 76 (accept 71 to 81)*

Scatter graphs and correlation *further practice* ANSWERS

13

A town recorded the hot water bottles sold and the number of gritting lorries out in eight winter weeks.

(a) Describe the correlation. (b) Pam says selling hot water bottles makes the council send out gritting lorries. Is she right? Explain.



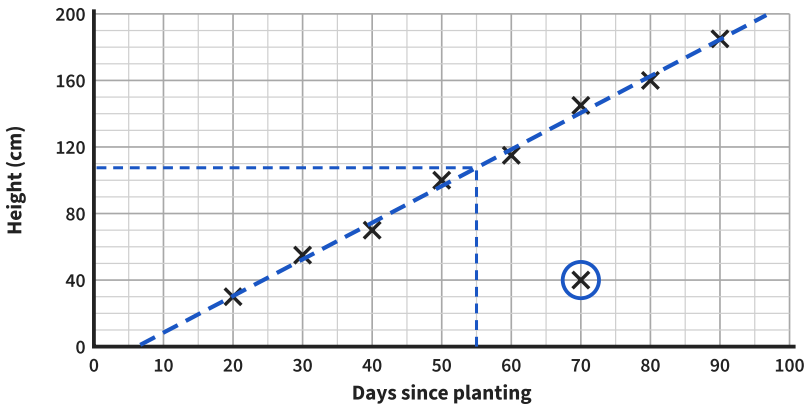
(a) *positive correlation*

(b) *No: cold weeks cause both*

14

Eva measured nine sunflowers in her garden.

(a) Circle the outlier and give a reason it might not fit. (b) Leave it out. Estimate the height of a sunflower 55 days after planting.



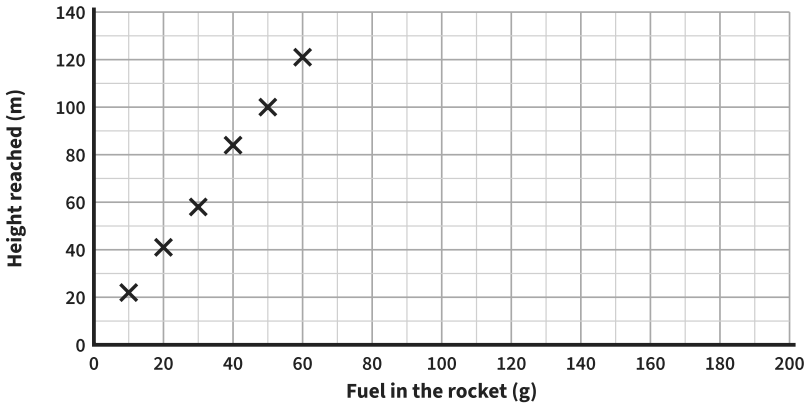
(a) *slugs ate it, or it was in the shade*

(b) *about 108 cm (accept 98 to 118)*

15

A club launched six model rockets with different amounts of fuel and measured how high each went.

Bo uses a line of best fit to estimate the height for 35 g of fuel and for 180 g. Which estimate is more reliable? Explain.



Answer *35 g: it is inside the data*

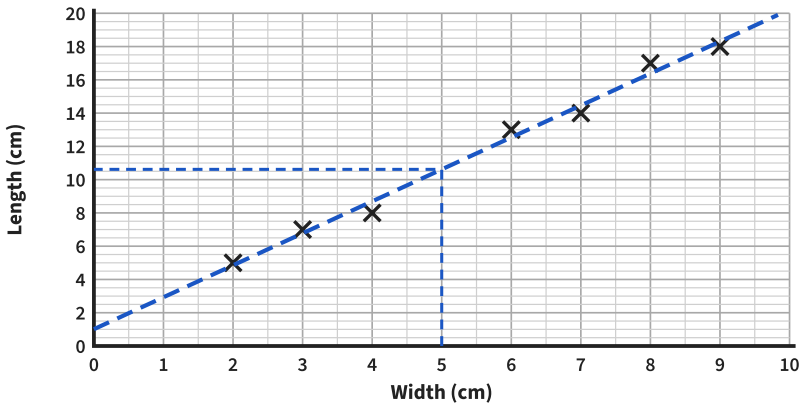
180 g is far outside it

16

Eight leaves from one tree. The length of the leaf 5 cm wide is missing. The graph shows the other seven.

Width (cm)	2	3	4	5	6	7	8	9
Length (cm)	5	7	8		13	14	17	18

Suggest a length for the missing leaf.
Explain how you chose it.



Length *about 11 cm (accept 10 to 12)*

Because *it fits the line of best fit*